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pairs of sockets and balls joined by trunnions, the same degree of reorientation is possible, but without the binding axial force. The only friction acting against pivoting reorientation of the outlet 28 is in the trunnions, therefore the torque due to friction is vastly reduced and, thus the present invention is usable where prior swivels are not. The threads of the trunnions 56, 88 and 114 are preferably fixed from threaded rotation by use of a high strength anaerobic adhesive such as made by the Loctite Corporation and sold under the trademark Loctite #271.

Downstream from the second ball 106 is a nozzle coupling 118 that is preferably threaded to receive a variety of nozzles. When a nozzle is fitted to the pivoting outlet 28, the nozzle's weight will force the outlet 28 to pivot downward. Obviously, unintended redirection of the nozzle is not desirable so the present invention is preferably fitted with a mechanism to resist unintended movement. The nozzle coupling 118 may also be connected to or integrally formed with any desired connector style, or be integrated with the nozzle inlet itself. It is to be understood that additional ball and socket combinations could be added to the above-described double ball and socket combinations to add additional range of motion in a pivoting connector.

As illustrated in FIGS. 4 and 5, there is a one-way brake 200 that restricts pivoting movement in one direction about an axis while permitting unrestricted movement in the opposite direction about the same axis. Thus, raising movement of the pivoting outlet 28 and its nozzle is not restricted, but a lowering movement of the nozzle is prevented unless intended by the firefighter. Although there is depicted only one one-way brake, a second one-way brake could be added to restrict movement about the other axis.

The one-way brake 200 includes: a trunnion 202, a sleeve 204 fitted to the trunnion 202, springs 206, cylinders 208, and a brake housing 210. The trunnion 202 can be any trunnion in either the pivoting inlet 26 or the pivoting outlet 28, but is preferably in the pivoting outlet 28 and horizontally oriented to resist nozzle weight. The trunnion 202 is fixed to either the ball or the socket of the pivoting joint, but in the illustrated example is fixed to the ball 80. A shoulder 212 is part of the trunnion 202 to provide a surface for the sleeve 204 to bear against.

The sleeve 204 is operable to engage the trunnion 202 due to a spring washer 235 and nut 236 that provide axial load to push the sleeve 204 into the shoulder 212 on the trunnion 202. This axial load provides rotational drag due to friction between the faces of the sleeve 204, the shoulder 212, and the spring washer 235. The position of the nut 236 is fixed by a tapered pipe plug 240 that is threaded into the trunnion 202. The trunnion 202 is slotted so that when the tapered pipe plug 240 is inserted, the trunnion 202 expands to fix the nut 236.

The sleeve 204 is shaped to provide steps 216 on which the springs 206 and cylinders 208 can act to resist unintended movement. The sleeve 204 can have as many steps 216 as necessary to resist expected loads and provide smooth one-way brake movement. As examples, the FIG. 4 embodiment illustrates six steps 216 and the FIG. 5 embodiment illustrates three steps 216. The sleeve 204 is disposed in a cylindrical opening 209 of the brake housing 210 and together with the sleeve steps 216 define tapered slots 218 having a wide end 220 and a narrow end 222.

Inside the tapered slots 218, the cylinders 208 and springs 206 are disposed, as illustrated in FIG. 4 with the springs 206 toward the slot wide ends 220 and the cylinders 208 toward the tapered slot narrow ends 222. In this manner, the

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springs 206 urge the cylinders 208 into the tapered slot narrow ends 222. Friction between the cylinders 208 and the brake housing 210 prevents the sleeve 204 from rotating relative to the brake housing 210, thereby preventing free rotation of the pivoting joint about the trunnion 202 in the locked direction 226. On the other hand, rotation in the unlocked direction 228 is possible because the cylinders 208 move toward the tapered slot wide end 220 where there is little or no friction between the cylinders 208 and the brake housing 210. The springs 206 may be of any type including compression, leaf, or preferably, elastomeric tubing of silicone rubber material inserted along an axis parallel with the axis of the cylinders 208.

The weight of a nozzle causes the cylinders 208 to move toward the small end of the tapered space 222 and effectively lock the sleeve 204 to the brake housing 210. Friction between the sleeve 204, the trunnion 202, and the spring washer 236 support the weight of the nozzle. To lower the nozzle's elevation, an operator merely pushes down on the nozzle to overcome the friction between the sleeve 204 and the trunnion shoulder 212. To raise the nozzle, an operator pulls up on the nozzle causing the cylinders 208 to the wide end of the slot 220 thereby releasing the sleeve from the brake housing 210 and allowing the nozzle to move up without drag from the sleeve 204. Tapered slots 218 are preferably shaped to define a four degree pinch angle with a one inch diameter cylindrical opening 209, and the cylinders 208 are $\frac{1}{8}$ of an inch in diameter.

The brake housing 210 is fixed to the opposite component of the pivoting joint to which the trunnion 202 is fixed. A simple crew 232 makes the connection.

The foregoing detailed description of drawings is provided for clearness of understanding only, and no unnecessary limitations therefrom should be read into the following claims.

What is claimed is:

1. A pivoting fluid conduit joint comprising:

- a socket;
- a ball disposed in the socket for movement relative to the socket; and
- a trunnion joining the ball and socket to permit relative pivoting movement between the ball and socket about an axis defined by the trunnion, wherein the trunnion is fixed to the ball, and
- a one-way brake, wherein the one-way brake comprises:
 - a stepped sleeve operable to engage the trunnion;
 - a brake housing fixed to the socket and defining a cylindrical opening for receiving the stepped sleeve, the brake housing and the stepped sleeve cooperate to define a tapered slot having a wide end and a narrow end;
 - a cylinder disposed in the tapered slot; and
 - a spring disposed in the wide end of the tapered slot to urge the cylinder toward the narrow end of the tapered slot.

2. A pivoting fluid conduit joint comprising:

- a socket;
- a ball disposed in the socket for movement relative to the socket;
- a trunnion joining the ball and socket to permit relative pivoting movement between the ball and socket about an axis defined by the trunnion, wherein the trunnion is fixed to the socket; and
- a one-way brake wherein the one-way brake comprises:

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a stepped sleeve operable to engage the trunnion;
 a brake housing fixed to the ball and defining a cylindrical opening for receiving the stepped sleeve, the brake housing and the stepped sleeve cooperate to define a tapered slot having a wide end and a narrow end;
 a cylinder disposed in the tapered slot; and
 a spring disposed in the wide end of the tapered slot to urge the cylinder toward the narrow end of the tapered slot.

3. A pivoting fluid conduit joint defining a conduit, comprising:

- a first socket;
- a first ball disposed in the first socket and pivotably joined to the first socket along a first axis;
- a second socket fixed to the first ball;
- a second ball disposed in the second socket and pivotably joined to the second socket along a second axis oriented at a substantially right angle to the first axis;
- a trunnion fixed to the first ball; and
- a brake for resisting pivoting movement of the first ball relative to the first socket, wherein the brake comprises:
 - a stepped sleeve operable to engage the trunnion;
 - a brake housing fixed to the socket and defining a cylindrical opening for receiving the stepped sleeve, the brake housing and the stepped sleeve cooperate to define a tapered slot having a wide end and a narrow end;

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a cylinder disposed in the tapered slot; and
 a spring disposed in the wide end of the tapered slot to urge the cylinder toward the narrow end of the tapered slot.

4. A pivoting fluid conduit joint defining a conduit, comprising:

- a first socket;
- a first ball disposed in the first socket and pivotably joined to the first socket along a first axis;
- a second socket fixed to the first ball; and
- a second ball disposed in the second socket and pivotably joined to the second socket along a second axis oriented at a substantially right angle to the first axis;
- a trunnion fixed to the first socket, and a brake for resisting pivoting movement of the first ball relative to the first socket, wherein the brake comprises:
 - a stepped sleeve operable to engage the trunnion;
 - a brake housing fixed to the ball and defining a cylindrical opening for receiving the stepped sleeve, the brake housing and the stepped sleeve cooperate to define a tapered slot having a wide end and a narrow end;
 - a cylinder disposed in the tapered slot; and
 - a spring disposed in the wide end of the tapered slot to urge the cylinder toward the narrow end of the tapered slot.

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